Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

A PECULIAR MORPHOLOGIC DEVELOPMENT OF AN EGG OF THE GENUS TROPIDOCERCA AND ITS PROBABLE SIGNIFICANCE

WINTHROP D. FOSTER
Junior Zoologist, Bureau of Animal Industry, U. S. Department of Agriculture.

The accompanying drawing represents the egg of a species of *Tropidocerca* from the proventriculus of an American woodcock (*Philohela minor*) shot at Bowie, Md., Nov. 11, 1912. A comparison of the specimens found, with the different species descriptions, shows that the specimens belong in all probability to an undescribed species, but as no male worms were recovered it is considered inadvisable to publish a specific description until more material can be collected.

The drawing is presented to show the peculiar filiform appendages projecting from either pole, a feature not only undescribed in any of the species of this genus, but, as far as the writer is aware, unique in the literature of nematodes.* The appendages consist of a cluster of seventeen to twenty-three filaments at either pole of the egg. Most of these are not over half the length of the egg, but one or two at either pole are over twice as long.

One of the distinguishing characteristics of the trematode family, Notocotylidae, is the fact that the eggs are provided with a single long filament at either pole. To judge from the drawing of an egg of *Notocotyle quinqueseriale* Barker and Laughlin (1911), these filaments are simple prolongations of the chitinous shell. This is certainly the case in the genus *Microcotyle*, certain species of which have similar filaments, as MacCallum (1913) has seen these filaments in the process of formation from the shell. The filaments of *Tropidocerca* are, however, apparently of a different nature, and are undoubtedly formed in a different manner.

In examining a number of *Tropidocerca* eggs removed from a ruptured uterus, it was observed that only those eggs which contained fully developed embryos and which were in a position to pass through the vagina, were equipped with these filaments. Less mature eggs had perfectly smooth shells, as with most nematodes. It is obvious, therefore, that the filaments are not simple prolongations of the chitinous shell, but are added after the egg-shell is complete. This is also apparent from the figure in which the egg-shell is seen to form a complete ellipse, to the surface of which the filaments are attached.

---

* Since this note was submitted for publication an article has appeared by Seurat (Compt. rend. Soc. de Biol. v. 76, 15 mai 1914) describing *Tropidocerca nouvelli* n. sp. which is characterized by similar appendages attached to the poles of the embryonated eggs. Seurat points out that similar appendages were observed by Kölliker on the eggs of *Ascaris dentata,* and by Lieberkühn in his *Tropidocerca fissispina.* Lieberkühn, failing to find this feature on all the eggs, considered it merely as an individual anomaly.

Leuckart (1867) has shown that the albuminous covering of the eggs of *Ascaris lumbricoides* is deposited after the chitinous shell is complete, and the mamillations of this covering and the fact that it appears only on completely formed eggs suggest an analogy with these filiform appendages.

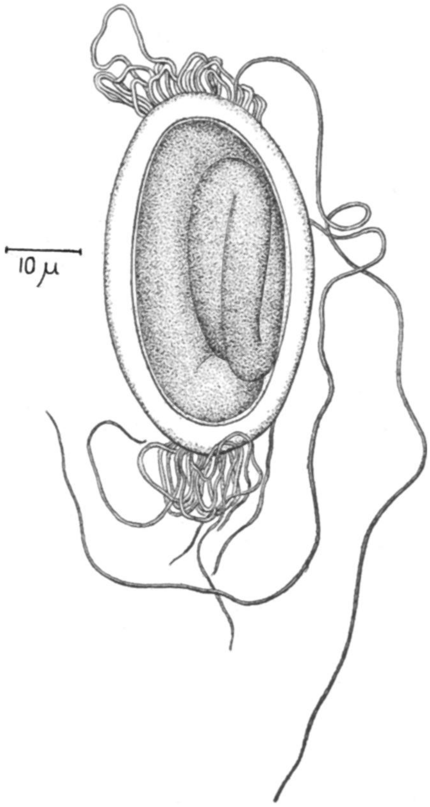

Fig. 1.—Egg of *Tropidocerca sp.,* showing masses of filaments projecting from either pole.

In one of the specimens of *Tropidecerca sp.* examined by the writer, which had been pressed under a cover-glass, a number of eggs attached at their poles by the entangling of their filaments, were seen to be forced through a rupture in the uterus. It would appear, therefore, that these filaments are for the purpose of causing a number of eggs to cling together, thereby increasing the chances of infestation in the host. It is suggested by von Linstow (1879) that the eggs of the genus *Tropidocerca* require an intermediate host. He bases his opinion on the relative thickness of the shell, the great number of eggs in a single female and their similarity to the eggs of the genus *Filaria.* If the life cycle is indirect, it would appear decidedly advantageous for the parasite that the intermediate host should be heavily parasitized, since in this way the handicap of an indirect life cycle would be lessened.

The eggs of different groups of parasites are not infrequently provided with means for furthering their life cycle. These devices are either to enable the egg to remain on its host in the case of ectoparasites, or to insure a heavy infestation of the host in the case of endoparasites. Among the former may be mentioned the long filamentous hooklets which enable the egg of the genus *Menopon* to fasten in the feathers of the host, and the method of glueing the eggs of *Haematopinus* to the hairs of its host. As a method of insuring a heavy infestation of the host in endoparasites may be mentioned the egg sacs of the cestode genus *Davainea* and the strings of eggs oviposted by *Strongyloides ovocinctus.* In this case, as described by Ransom (1911), "the eggs passing out of the vulva lodge beneath an outer cuticular layer, which, when finally shed by the worm, is transformed into elongated egg-sacs, each containing from half a dozen to fifty or more eggs." A still closer analogy to the filamentous appendages shown is seen in the mamillated albuminous covering of *Ascaris lumbricoides,* which, as Blanchard (1888) has observed, sometimes causes the eggs to adhere to one another at the poles, exactly as was observed in the case of *Tropidocerca.*

REFERENCES CITED

Barker, D., and Laughlin, J. W. 1911. A new species of Trematode from the muskrat, *Fiber zibethicus.* Trans. Am. Micr. Soc., 30.

Blanchard, R. 1888. Traité de zoologie médicale, v. 1.

Leuckart, R. 1867. Die menschlichen Parasiten. v. 2, 1. Lief.

von Linstow, O. 1879. Helminthologischen Studien. Arch. f. Naturg., 45: 178.

MacCallum, G. A. 1913. Further notes on the genus Microcotyle. Zool. Jahrb., Syst., 35.

Ransom, B. H. 1911. The nematodes parasitic in the alimentary canal of cattle, sheep, and other ruminants. Bull. 127, Bureau Animal Industry.